CLAIMS

1-4. (Cancelled).

5 (Currently Amended). The compressor of claim [[48]] 75 with said compressing means operating inside a pressure vessel.

6 (Previously Presented). The compressor of claim 5 with a filtered hydraulic fluid reservoir.

7 (Previously Presented). The compressor of claim 5 where said pressure vessel is a separator.

8 (Cancelled).

9 (Previously Presented). The compressor of claim 5 wherein said free-floating shafts and pistons automatically adjust their velocity and stroke distance to those required to pump fluids from said pressure vessel with said power supply.

10 (Currently Amended). The compressor of claim [[8]] 5 wherein said [[rods]] free-floating shafts and pistons automatically adjust their reciprocating rates to those required to pump fluids from changing wellhead pressures.

11 (Previously Presented). The compressor of claim 5 wherein said free-floating shafts and pistons automatically adjust their reciprocating rates to those required to pump fluids from changing pipeline pressures.

12 (Currently Amended). The compressor of claim [[1]] 5 with a power source that is external from said pressure vessel.

13 (Currently Amended). The compressor of claim [[1]] 5 immersed in external fluids in a pressure vessel wherein heat generated during compression is exchanged to heat said external fluids and liquids, if any, mixed with said gasses being compressed, thereby producing heated and compressed fluids.

14 (Previously Presented). The compressor of claim 13 wherein said heated and compressed fluids are used as injection fluids to lift fluids from said oil and gas well without interrupting recovery from said well.

15 (Previously Presented). The compressor of claim 14 wherein said injection fluids are from an oil and gas well.

16 (Previously Presented). The compressor of claim 53 wherein said ram control means includes a directional control valve in fluid and electrical communication with said compression cylinders.

17 (Cancelled).

18 (Previously Presented). The compressor of claim 16 wherein said inlet compression cylinder is in fluid communication with said inlet fluids from said well, and said outlet compression cylinder is in fluid communication with injection tubing in said well during injection and with recovery lines during recovery of excess gas.

19 (Currently Amended). The compressor of claim [[48]] <u>75</u> wherein said compression cylinders are connected serially, beginning with a first, lower pressure compression cylinder and ending with a last, higher pressure compression cylinder.

20 (Previously Presented). The compressor of claim 18 with two compression cylinders.

21 (Previously Presented). The compressor of claim 20 wherein said hydraulic fluid pumping means utilizes the power from said power source by moving the maximum inlet gas volume through said compression cylinders, compressing said maximum inlet gas volume into a first compressed volume, moving said first compressed volume through said outlet compression cylinder, further compressing said first compressed volume into an outlet volume, and discharging said outlet volume through said outlet valve.

22 (Currently Amended). The compressor of claim [[48]] <u>75</u> wherein said power source is an electric motor.

23 (Previously Presented). The compressor of claim 20 wherein said ram control means includes a pressure compensating flow control valve.

24 (Currently Amended). The compressor of claim [[48]] <u>75</u> wherein said power source is a natural gas engine.

25 (Previously Presented). The compressor of claim 20 wherein said hydraulic fluid pumping means is a gear and said ram control means includes a switching valve.

26 (Previously Presented). The compressor of claim 20 wherein said pumping means is a piston and said ram control means is contained in said pumping means.

27 (Previously Presented). The compressor of claim 26 wherein said directional control valve includes

a first connection in fluid communication with said ram chamber of said inlet compression cylinder,

a second connection in fluid communication with said ram chamber of said outlet compression cylinder,

a third connection in fluid communication with said hydraulic fluid pumping means,

a fourth connection in fluid communication with said hydraulic fluid reservoir,

a first valve position,

a second valve position,

a third valve position;

and said ram monitoring means includes

a pressure sensing switch in electrical communication with said directional control valve and capable of sensing the hydraulic pressure in said ram chamber of said inlet compression cylinder; and

a pressure sensing switch in electrical communication with said directional control valve and capable of sensing the hydraulic pressure in said ram chamber of said outlet compression cylinder.

28 (Currently Amended). The compressor of claim 27 wherein [[said]] the swept volume of [[said]] the compression chamber of said inlet compression cylinder is greater than the swept volume of [[said]] the compression chamber of said outlet compression cylinder.

29 (Currently Amended). The compressor of claim 28 wherein [[the]] said swept volume of said compression chamber of said inlet compression cylinder is four times said swept volume of said compression chamber of said outlet compression cylinder.

30 (Previously Presented). The compressor of claim 27 wherein

when said directional control valve is in said first position, said hydraulic fluid pumping means pumps hydraulic fluid from said hydraulic fluid reservoir through said third and first connections to said inlet compression cylinder and returns said fluid through said second and fourth connections to said reservoir,

when said directional control valve is in said second position, said hydraulic fluid pumping means pumps hydraulic fluid from said hydraulic fluid reservoir through said third and second connections to said outlet compression cylinder and returns said fluid through said first and fourth connections to said reservoir, and

when said directional control valve is in said third position, said hydraulic fluid flows from said reservoir through said third and fourth connections back to said reservoir.

31 (Currently Amended). The compressor of claim [[48]] 75 wherein the swept volume of [[said]] the compression chamber of each of said compression cylinders decreases from that

of said inlet compression cylinder to that of said outlet compression cylinder in the same order as each such compression cylinder is used sequentially in said compressor.

32 (Currently Amended). The compressor of claim 19 wherein the ~~compressing~~ compression cylinder of [[said]] the first compressing stage is in fluid communication with said natural gas from said well.

33 (Currently Amended). The compressor of claim 19 wherein the ~~compressing~~ compression cylinder of [[said]] the last compressing stage is in fluid communication with injection tubing in said well during injection of fluids into said well.

34 (Currently Amended). The compressor of claim 19 wherein the compressi[[ng]]on cylinder of [[said]] the last compressing stage is in fluid communication with recovery lines during recovery of well fluids.

35 (Previously Presented). The compressor of claim 36 wherein said spring loaded inlet check valve prevents said inlet valve from opening unless the pressure of said inlet gasses equals or exceeds the load provided by the spring in said inlet valve, thereby causing said ram control means to recycle hydraulic fluid flow back to said reservoir such that said compressor stops compressing until said pressure of said inlet gas overcomes said load provided by said spring in said inlet valve.

36 (Currently Amended). The compressor of claim [[48]] 75 wherein said inlet valve monitoring means is a spring loaded inlet check valve.

37 (Currently Amended). The compressor [[in]] of claim 35 wherein said spring loaded inlet valve is loaded to prevent said inlet valve from opening unless the pressure of said inlet gas equals or exceeds said load provided by the spring in said inlet valve, and to switch said ram switching means to interrupt fluid flow from said reservoir to said ram chambers in said compression cylinders such that said compressor stops compressing said inlet gas when said pressure of said gas is less than said load provided by said spring in said inlet valve, and said hydraulic fluid recycles to and from said reservoir.

38 (Previously Presented). The compressor of claim 37 wherein said ram control means includes a 2-way motor valve with diaphragm in gas communication with said spring loaded inlet valve such that said 2-way motor valve is open when said inlet gas pressure is less than said load provided by said spring in said spring loaded valve and otherwise closed.

39 (Withdrawn). A HEC heater with a heating element wherein HEC-heated fluids circulate through said heating element.

40 (Withdrawn). A heated fluid injection system wherein fluids are heated by the heater in claim 39 and injected into an oil and gas well without interrupting recovery from said well.

41 (Currently Amended). A lift gas injection system wherein compressed lift gas is supplied by the compressor of claim [[48]] 75..

42 (Withdrawn). A heat exchange compressor (HEC) that compresses and heats fluids in a backwash production unit (BPU).

43 (Withdrawn). The compressor of claim 42 that transfers heat to fluids in a BPU for injection in an oil and gas recovery system.

44 (Cancelled).

45 (Cancelled).

46 (Currently Amended). The compressor of claim {[45]] 73 wherein the composition of said inlet fluids further controls said stroke frequency of said compressor and said rate of compression of said gasses by varying stroke length.

47 (Cancelled).

48 (Cancelled).

49 (Currently Amended). The compressor of claim [[48]] 75 wherein said heat exchange means includes one or more of said inter-chamber fluid communication means, one or more of said compression cylinders, or any combination thereof.

50 (Currently Amended). The compressor of claim [[48]] 75 wherein the rate of compression is zero when said pressure of said inlet gasses does not exceed a threshold pressure.

51 (Currently Amended). The compressor of claim [[48]] 75 wherein the rate of compression and stroke frequency is influenced by the composition of said inlet fluids.

52 (Currently Amended). The compressor of claim 51 wherein the horsepower of said power supply is insufficient to pump the free-floating piston in at least one of the lower pressure cylinders through the entire available volume of said cylinder and the rate of compression and stroke frequency are controlled by said pressure of said inlet gasses [[when]].

53 (Previously Presented). The compressor of claim 7 wherein said inlet fluids are wellhead fluids lifted from an oil and gas well.

54 (Previously Presented). The compressor of claim 53 wherein said wellhead fluids are separated into gas, oil and water phases in said separator.

55 (Previously Presented). The compressor of claim 54 with a distribution control means for controlling the distribution of compressed gas, oil phase, and water phase to recovery lines and injection tubing without interrupting production.

56 (Currently Amended). The compressor of claim 55 wherein the distribution control means includes

a spring loaded check valve to provide fluid communication between said outlet cylinder and said distribution control means when the discharge pressure of compressed gas exceeds a manually-set threshold pressure,

a 3-way motor valve to provide fluid communication between said outlet cylinder and said injection tubing and said recovery lines,

a gas pilot valve in gas communication with said inlet gas in said pressure vessel for controlling said 3-way motor valve,

a liquid level controller for monitoring the level of said water phase in said pressure vessel,

a phase level controller for monitoring the level of said oil phase in said pressure vessel,

a water phase dump valve in fluid communication with said liquid level controller and said recovery lines and injection tubing,

a<u>n</u> oil phase dump valve in fluid communication with said phase level controller and said recovery lines and injection tubing,

an oil phase motor valve in fluid communication with said oil phase dump valve and said recovery lines,

a water phase motor valve in fluid communication with said water phase dump valve and said recovery lines,

a source of instrument gas for controlling said pilot valve, dump valves, motor valves, and controllers,

a manual water dump valve and an oil phase dump valve in fluid communication with said pressure vessel and with said recovery lines and injection tubing.

57 (Previously Presented). The compressor of claim 56 wherein:

said oil and gas well is injecting all of the natural gas lifted, and said oil phase and said water phase are flowing for injection, when all of said valves are closed;

said oil phase is being stored when said oil phase dump valve is open, and

said water phase is being stored when said water phase dump valve is open.

58 (Previously Presented). The compressor of claim 56 recovering excess compressed gas and storing said oil phase and said water phase liquids when said gas pilot valve, said 3-way motor valve, said oil and water phase motor valves, and said manual dump valves are open.

59 (Previously Presented). The compressor of claim 56 injecting compressed gas and said oil phase liquids and storing said water phase liquids when said gas pilot valve, said 3-way motor valve, said oil and water phase motor valves, and said manual water phase dump valves are closed and said manual oil phase dump valve is open.

60 (Previously Presented). The compressor of claim 56 injecting compressed gas and said oil phase liquids and said water phase liquids when said gas pilot valve, said 3-way motor valve, said oil and water phase motor valves, and said manual water and water phase dump valves are closed.

61 (Previously Presented). The compressor of claim 56 wherein the composition and pressure of the wellhead fluids control production..

62 (Previously Presented). The compressor of claim 57 wherein the pilot valve inlet of said gas pilot valve is in gas communication with said instrument gas and the pilot valve outlet of said gas pilot valve is in gas communication with the diaphragm of said 3-way motor valve such that when the flow of said instrument gas is blocked by said gas pilot valve, a first outlet of said 3-way valve is open and a second outlet is closed, but when said instrument gas is flowing through said gas pilot valve to said diaphragm of said 3-way motor valve, said second outlet of said 3- way valve is open, and said first outlet is closed.

63 (Previously Presented). The compressor of claim 54 wherein the composition of said wellhead fluids controls the distribution of said compressed gas and oil and gas phases for recovery or injection into said well, or both.

64 (Previously Presented) The compressor of claim 53 with two compression chambers wherein said compression cylinders have a length of 108", said input compression cylinder has a diameter of 8" and its ram cylinder has a diameter of 2.375", and said outlet compression cylinder has a diameter of 4" and its ram cylinder has a diameter of 2.375" initially at 120 °F compressing inlet gas to 1000 PSIG wherein the stroke frequency is::

6.200 strokes/minute when the inlet pressure is 40 PSIG,

6.804 strokes/minute when the inlet pressure is 80 PSIG,

7.626 strokes/minute when the inlet pressure is 120 PSIG and

9.902 strokes /minute when the inlet pressure is 200 PSIG.

65 (Previously Presented). The compressor of claim 53 with two compression chambers wherein said compression cylinders have a length of 234", said input compression cylinder has a diameter of 8" and its ram cylinder has a diameter of 2.375", and said outlet compression cylinder has a diameter of 4" and its ram cylinder has a diameter of 2.375" initially at 120 °F compressing inlet gas to 210 PSIG wherein the stroke frequency is:

5.694 strokes/minute when the inlet pressure is 40 PSIG,

6.157 strokes/minute when the inlet pressure is 80 PSIG,

6.893 strokes/minute when the inlet pressure is 120 PSIG and

9.088 strokes /minute when the inlet pressure is 200 PSIG.

66 (Currently Amended). The compressor of claim 53 with [[the]] two compression chambers wherein said compression cylinders have a length of 108", said input compression cylinder has a diameter of 12" and its ram cylinder has a diameter of 3.5", and said outlet compression cylinder has a diameter of 6" and its ram cylinder has a diameter of 3.5" initially at 120 °F compressing inlet gas to 1000 PSIG wherein the stroke frequency is:

4.948 strokes/minute when the inlet pressure is 40 PSIG,

5.375 strokes/minute when the inlet pressure is 80 PSIG,

6.051 strokes/minute when the inlet pressure is 120 PSIG and

8.084 strokes /minute when the inlet pressure is 200 PSIG.

67 (Currently Amended) The compressor of claim 53 with [[the]] two compression chambers wherein said compression cylinders have a length of 108", said input compression cylinder has a diameter of 8" and its ram cylinder has a diameter of 2.4375", and said outlet compression cylinder has a diameter of 4" and its ram cylinder has a

diameter of 2.4375" initially at 120 °F compressing inlet gas to 1000 PSIG wherein the stroke frequency is:

5.395 strokes/minute when the inlet pressure is 40 PSIG,

5.744 strokes/minute when the inlet pressure is 80 PSIG,

6.379 strokes/minute when the inlet pressure is 120 PSIG and

8.272 strokes /minute when the inlet pressure is 200 PSIG.

68 (Previously Presented) The compressor of claim 53 with three compression chambers wherein said input compression cylinder has a length of 108" and a diameter of 8" and its ram cylinder has a diameter of 2.375", and said outlet compression cylinder has a length of 96" and a diameter of 2" and its ram cylinder has a diameter of 3", and the middle compression cylinder has a length of 108" and a diameter of 4" and its ram cylinder has a diameter of 2.375" initially at 120 °F compressing inlet gas to 8000 PSIG wherein the stroke frequency is:

5.728 strokes/minute when the inlet pressure is 40 PSIG,

6.070 strokes/minute when the inlet pressure is 80 PSIG,

6.477 strokes/minute when the inlet pressure is 120 PSIG and

7.480 strokes /minute when the inlet pressure is 200 PSIG.

69 (Previously Presented). The process of using a compressor capable of pumping liquid/gas mixtures to produce compressed gas and heated liquid from said fluid mixtures comprising:

the introduction of said fluid mixture into said compressor,

the compression of gasses in said mixture to said compressed gasses,

the transfer of at least a portion of the heat of compression to liquids in said mixture with the simultaneous heating of said liquids to heated liquids and cooling of said compressed gasses to cooled gasses,

the removal of said cooled gasses and heated liquids from said compressor, and

the separation of said cooled gasses and heated liquids.

70 (Previously Presented). The process of claim 69 wherein said compressed gasses are injected into an oil and gas well as lift gas and said heated liquids are injected into said well for well maintenance without interrupting the injection of said lift gasses.

71 (Previously Presented). The process of claim 70 wherein said lift gas is natural gas recovered from said well and said heated liquids include crude oil, water or a mixture thereof recovered from said well.

72 (Withdrawn). The heater of claim 39 wherein said heating element is incorporated in oil and gas well infrastructure such that said heater provides heat for down hole well maintenance.

73. (New). A heat exchange compressor for pumping inlet fluids, which may be inlet liquids, inlet gasses or inlet liquids mixed with inlet gasses, with multiple compressing stages capable of pumping said liquids and compressing said gasses wherein the inlet pressure of said gasses controls the stroke frequency of said compressor and the rate of compression of said gasses by varying stroke length.

74. (New). A heat exchange compressor for pumping inlet fluids, which may be inlet liquids, inlet gasses or inlet liquids mixed with inlet gasses, with multiple compressing stages capable of pumping said liquids and compressing said gasses wherein the inlet pressure of said gasses further controls said compressor by interrupting compression without interrupting the flow of hydraulic fluid.

75. (New). A heat exchange compressor for pumping inlet fluids, which may be inlet liquids, inlet gasses or inlet liquids mixed with inlet gasses, with multiple compressing stages capable of pumping said liquids and compressing said gasses with a power supply and a compressing means that includes

a hydraulic fluid pumping means in fluid communication with a hydraulic fluid reservoir,

an inlet compression cylinder with an inlet valve, an outlet valve, and an end plate with openings for said valves,

an inlet monitoring means for monitoring the pressure of inlet gasses in said inlet fluids,

an outlet compression cylinder with an inlet valve, an outlet valve, and an end plate with openings for said valves,

an outlet monitoring means for controlling release of compressed fluids from said outlet compression cylinder,

at least one pair of serially-connected compression cylinders comprising a higher pressure compression cylinder, which may be said outlet compression cylinder, and a lower pressure compression cylinder, which may be said inlet compression cylinder,

a compression chamber and a ram chamber in each of said compression cylinders,

a free-floating shaft and piston in each of said ram chambers for pumping fluids, which may be gasses, liquids or both,

an inter-chamber fluid communication means between said compression chambers of said serially-connected compression cylinders,

an inter-chamber valving means for controlling said inter-chamber fluid communication means,

a ram control means with

a ram monitoring means for monitoring hydraulic pressure in said ram chambers and

a ram switching means for controlling the flow of hydraulic fluid to said compression cylinders, and

a heat exchange means in thermal communication with said compression means wherein the heat of compression generated during compression heats liquids, which may be internal liquids, external liquids, or both, to produce heated liquids.